The Habitat Gardens at
Sawmill Multicultural Art and Nature County Park

2020 Accomplishments and Plans for 2021

Contents

Report by Susan Lamb, Coordinator of Garden Volunteers. susan@susanlamb.net

2020 Summary

The 2020 gardening season was our most rewarding yet! Locals and visitors flocked to the gardens in record numbers. Members of the American Conservation Experience (ACE) volunteered on most weekends, taking on the most difficult tasks with competence, enthusiasm, and humor. Several Eagle Scout candidates accomplished significant projects that will benefit the gardens for years to come. And although we did not actively recruit local community volunteers due to restrictions imposed by the pandemic, several of them helped on a regular basis anyway. Volunteers contributed at least 1,642 hours, not counting those of long-time volunteer Norm Lowe and totals from some of the Scout projects. The Arboretum at Flagstaff continued to be a helpful and knowledgeable partner, cheerfully providing us with plants and advice we could not have found anywhere else. Donors gave us several tools and plants.

The most impressive accomplishment in the gardens has been the fabrication and installation of the wildlife viewing platform, where everyone stops to get their bearings, study the bronze wildlife casts, and settle themselves down for their visit to the gardens. On the other side of the gardens, children have already learned to play with the features and creatures of the Outdoor Classroom.

Eagle Scout projects included:

Installation of gutters, downspouts, drainage platforms, drainpipes, and rainbarrels to harvest rainwater from the roof of the shed and the northwest portion of the EE Center roof;

Replacement of compacted and weed-infested soil in the Wildflower Meadow with amended topsoil, seven species of native bunchgrass, and several native forbs;

Creation of a Welcoming Patio at the entrance to the EE Center with flagstones, benches, and poles for suspending a sun sail to provide shade during the summer;

Building of a large, three-bin composting system on a drainage platform, to produce compost for the gardens and provide a working demonstration of the benefits of composting;

Spreading and compacting cinnamon soil and staining benches in the Outdoor Classroom.

ACE projects included:

Creating a walkway of cinnamon soil around the sundial;

Completing the south end of the medicinal plant garden;

Digging up outdated interpretive signs;

Rescuing bunchgrasses and forbs from areas where soil would be replaced (rescued plants were replanted after the beds were prepared).

The 2020 gardening season posed challenges, too. For the second year in a row, the summer rains failed to arrive. Frequent watering kept our showiest gardens growing but we weren't able to save the Monarch Waystation below the rim: an Eagle Scout project from before our time, built on a southwest-facing slope,where it received relentless wind and harsh sun. The Milkweed Orchard, a collaboration with NAU built in 2019, struggled too. On the bright side, the drought discouraged the growth of weeds.

The Story of Our Intentions

In February of 2016, Willow Bend EE Center Executive Director Moran Henn and the five original garden volunteers met to envision how the gardens could better support the EE Center's programs. Under the guidance of Acting Parks and Recreation Director Brian Grube, we developed a detailed, long-term plan and presented it to the Willow Bend EE Center Board of Directors, the Board of the Coconino Natural Resource Conservation District, the Coconino County Parks and Recreation Commission, Dave Nash of the Friends of Coconino County Parks, and the Coconino County Board of Supervisors, among others. While awaiting approval of the plan, garden volunteers did minor maintenance such as weeding, seeding, planting, and watering. A visiting master stonemason led a Flagstaff flashmob in building the arch.

In the fall of 2017, volunteers received permission to implement the plan. At this point, our familiarity with the gardens and the activities typically held there led to a more integrative approach. Hearing entomologists teach Bug Camps persuaded us to vision the gardens as a hotspot of pollinator diversity that would support birds and lizards. Listening to visitors exclaim over what they did and didn't like made us resolve to make the gardens as attractive as we could, to encourage landscaping with native plants, and to deter trampling. Watching families, students, elders, and groups of friends unsure of how to engage the gardens gave us ideas about how to offer a more interactive and pleasant amenity for locals and visitors alike. And sadly, repeated discoveries of bedrolls, liquor bottles, and drug paraphernalia resulted in the decision to discourage certain activities by eliminating hiding places.

Our initial efforts were modest: simply continuing to weed, seed, plant, and water. We soon realized we were barely keeping the weeds under control and sometimes, not succeeding even at that. It became clear we would need to systematically restore each pocket garden with the following objectives in mind:

1. Reduce the need for maintenance:
   - replace poor, rocky or clayey soils that were contaminated with weed seeds;
   - add and amend fresh soil for better success with new plantings and to reduce water demand;
   - stabilize and/or replace rock walls and borders to minimize places where weeds could flourish.

2. Increase plant and pollinator diversity:
   - eradicate non-native plants;
   - curb aggressive native plants;
   - establish a wider range of native species, including both nectar and host plants.

3. Improve appearance:
   - arrange plants by shape, size, and color, and yet…
   - allow plants to decide for themselves where to settle—the reality is that planted perennials gradually move toward better spots over time, and seeds scattered from established plants sprout and thrive in places they find most most favorable—which can be a mystery to humans;
   - shape dips and rises in the ground, arrange boulders, add insect hotels and other features.

4. Support environmental education:
   - set an educational theme for each pocket garden and make decisions based on that theme.

Plans for Winter of 2020 and 2021 Gardening Season

1. Interpretation: Develop content for interpretive signs and website. Establish an iNaturalist project for the gardens. Share wildlife observations from trail cameras with visitors, and data from the Center's weather station with the National Weather Service and the public.

2. Irrigation: To establish plantings on Mount Lizard, CCPR will attach manifolds with tubes and drippers to the existing pipes from the reclaimed water source near the parking lot.

3. Wildlife: CCPR will develop a plan to effectively stabilize Mount Lizard and improve it as habitat for wildlife including reptiles, birds, and mammals, with appropriate hardscaping and plants. We would appreciate CCPR's advice in enhancing habitat for wildlife throughout the gardens.

4. Volunteer Program: Strengthen our volunteer program with an orientation/training day, celebrations for waking up the gardens in spring and putting them to bed in fall, special community-wide volunteer days, and maybe bandannas or t-shirts.

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2020 Report and Plans for 2021, Garden-by-Garden

Wildlife Viewing Platform, Orientation Kiosk, and Welcome Patio

This combination of projects was the most exciting development in the gardens ever! Now visitors will have a clear sense of where they are and how to enjoy it. The first step was installation of a viewing platform custom-made by Geoffrey Gross.


Site overlooking Sinclair Wash


Concrete Form


Finishing the Concrete


Making Animal Tracks


Delivery

There will be an interpretive sign to the left with information about Sinclair Wash habitats and wildlife.

Next came the Orientation Kiosk, also made by Geoffrey Gross. On one side it will hold signs to welcome visitors, introduce Sawmill County Park and the County Parks system, provide a map of the gardens, describe the Willow Bend Environmental Education Center (with a bulletin board to the side for info on current programs), and make note of the Coconino Natural Resource Conservation District. On the other side will be a map and information about the AWWE system, hints on observing wildlife in Sawmill County Park and Sinclair Wash, and a bulletin board for recent observations of wildlife.

Visitors will be welcomed and able to get their bearings, even on a gloomy day.

The third feature, a Welcome Patio, was a long time in the making. It began in 2017 with removal of a shrub blocking the EE Center door, weeding the area, trimming back the wild roses, and placement of four pots of native plants representing different parts of the garden. In 2019, the USFS Rocky Mountain Research Station donated four roofwater collection barrels.



2020: Volunteer Norm Lowe and Boy Scout Mason Takeuchi installed gutters and drainpipes to channel EE Center roofwater to two of the rainbarrels. They installed the other two to collect water from the shed.

Also 2020: Eagle Scout candidate Grant Berger and his team removed six inches of weedy dirt, installed two steel poles to hold a sun sail to provide shade for visitors, filled the area with cinnamon soil, arranged flagstones into a patio, and shortened the legs of two potting tables to provide tables for environmental education activities and/or seating. CCPR provided two boulders for seating as well.






The area in front of the EE Center can now be used for environmental education activities, as a place for parents to wait while their children take classes, or as a pleasant place to eat lunch or relax with a view. Note: The exposed end of a pipe carrying reclaimed water to this area was found to be broken. Volunteer Norm Lowe will re-route the reclaimed water through pex pipe to the back corner of the EE Center and install a lockable faucet for use in watering the northwest west side of the gardens. Volunteers will replace the faucets on the two orange rainwater barrels so they may be used for watering too.

2021: CCPR will repair the drinking fountain.

Monarch Waystation

2020: This Eagle Scout project, dating from before volunteers began work in the gardens, was again overwhelmed by invasive thistles and poison hemlock from down the slope. We contacted the manager of the City of Flagstaff Stormwater Division. He and his staff weeded and treated the invasives. Garden volunteers were unable to keep the waystation watered because the reclaimed water source is so far away and we didn't think we should use potable water. The waystation is now in very poor condition.

2021: CCPR and volunteers agree that unfortunately, it is time to give up on the Monarch Waystation.

Mount Lizard

Background: Mount Lizard is intended to mimic conditions on Mount Elden. A steep hill, it was built to demonstrate how southwest-facing slopes receive more solar radiation than level areas do. Every degree of slope toward the south may be said to achieve the same effect as moving a piece of land 40 miles closer to the equator. In an arid region, plants and animals on southwest-facing slopes must be adapted to extreme dryness as well as to intense solar radiation.

2016: Over time, the rocks, downed wood, and soil on the hill had worked their way downward. Weeds, grasses, and rogue rabbitbrush grew up among the yuccas, agaves, cactus, and other desert plants. The north and northeast slopes no longer sustained desert plants due to competition from grasses and weeds, which flourished in the cooler and more moist conditions there.

2018: An Eagle Scout project was an attempt to solve the situation on the north and northeast slopes by removing weeds and grasses and building rock niches for perennials more suited to those conditions. These two slopes were renamed the "Native Perennials Garden." However, the plantings were not very successful due to instability of the slope and its appeal as a place to climb up for a view.

2020: Weeding and grooming had somewhat restored the southwest side of the hill, but problems remained. CCPR determined the best course of action will be to reinforce the entire hill with large boulders and downed wood, arranged to create planting pockets for desert plants.

Rabbitbrush and Grass

Aggressive Grass

Daylighting Beargrass

Beargrass liberated from a rabbitbrush similar to the one on the upper left.

Native Perennials Garden

2021: This garden will be re-incorporated into the hill and its name will be eliminated. Volunteers will do a map search of Mount Elden flora using SEINet https://swbiodiversity.org/seinet/index.php to determine what would be best to plant in all areas of the hill in terms of both plant survival and wildlife habitat. We will ask The Arboretum at Flagstaff and the Highlands Center for Natural History which of those plants they can provide. Based on this search, volunteers will consult with CCPR to develop a planting and watering plan.

East side of Hill

North Side of Hill

Top of Hill

Sundial

Visitors have always been attracted to the sundial and thoroughly trampled the plants around it. ACE volunteers removed the soil from around the sundial, installed edging in a curve beside it, filled the space with cinnamon soil, and compacted it to create a three foot wide path. The weeds are gone, the path offers access to the sundial now, and visitors are no longer led to think it's fine to step on plants.

Large Wildflower Meadow

The meadow was once used for environmental education activities, which left the soil compacted and dominated by ragweed. Those programs are now held at FUSD schools. Volunteers weeded and seeded for three seasons but were unsuccessful in restoring the space.

2020: Eagle Scout candidate Zach Palmero and his team dug up, potted, and stored the remaining native plants from the meadow. They removed the soil, replaced it with amended topsoil, replanted the rescued plants, planted additional perennial forbs and native bunchgrasses (for a total of seven grass species) propagated by The Arboretum at Flagstaff, and broadcast wildflower seeds. This meadow will introduce visitors to the importance of northern Arizona grasslands, which foster up to eight times the biodiversity of the ponderosa forest understory. Surprisingly, a number of bunchgrasses are host plants for local butterflies. Board members of the Coconino Natural Resource Conservation District are very pleased to see bunchgrass featured in the gardens.








The Scouts finished this project in one day!

Small Wildflower Meadow

The small wildflower meadow was in better condition than the larger one, with fewer weeds and less soil compaction. ACE removed an outdated interpretive sign and flagstone beside the path on the west. Other volunteers continued to weed and seed this meadow, planted bunchgrasses rescued from the larger one, and arranged a birdbath, a roosting box donated by long-time supporter Kathie Satterfield, and feeders with suet and seeds donated by Jay's Bird Barn. These features are within view of EE Center windows, making it easy and fun for people to watch birds from inside the building as well as from a nearby outdoor bench. Next spring, volunteers will add plants propagated by Laura Davis in the NAU Greenhouse and water them until they are established.

Former Site of Sign and Flagstone

Bird-friendly Features outside Center

Hummingbird Garden

This garden is very easy to maintain since being rebuilt and replanted in 2018. It needed very little water despite the drought. Photos below are from early July after light rains in May. Later, the garden became more lush and colorful; native bunchgrasses really took off in August. Penstemon seeds from this garden blew onto the adjoining garden over the winter and became established there this summer.

Arch and Terraces

Local residents built the arch in 2017, in a free workshop offered by a Master Stonemason, a Scotsman named David Wilson who was traveling through North America on a Churchill Grant to study how stone projects can unite communities. Volunteers later put protective circles of stone and willow wickets around it, planted perennials, and kept the space mulched and weeded. In 2019, ACE built terraces in the nearby space and filled them with clean topsoil left over from another project. In 2020, volunteers planted native bunchgrasses there.

2021: Volunteers will plant more perennials in the terraces this year and continue to maintain both areas.

Native Bee Garden

2020: Volunteers added perennials to fill in the space and increase diversity, and will add more in 2021.

Before After Eagle Scout project in 2019

Volunteer sunflower and beeweed.

Diversity Garden

2020: Three penstemon species from the Hummingbird Garden colonized this recently restored garden! We don't seriously expect the insect hotel to be filled with pollinating insects or their larvae, but we hope it will lead visitors to think about the habitat needs and life cycles of various pollinators.

2021: Volunteers will add more native perennials.


Before


After

Compost Demonstration System

2020: Under the supervision of volunteer Bob Baer, Eagle Scout candidate Mason Takeuchi created a compost system based on his family's three generations of experience in composting and food gardening. Mason donated a chipper for volunteers to use in reducing woody brown debris, created an explanatory sign, and has continued to mix in vegetable trimmings from his volunteer work at the Flagstaff Family Food Center. Volunteers will use the compost to amend and mulch soils in the gardens.


Leveling the Area


Installing Weed Cloth


Preparing to Fill with Cinders


Filling with Cinders


All Finished!


Mason Takeuchi

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Milkweed Orchard

This collaboration with entomologist Dr. Michael Wagner of the NAU Milkweeds for Monarchs Program is intended to raise milkweeds for seed, to be distributed to grow milkweeds elsewhere. Dr. Wagner designed the terraces to flood during the rainy season, an idea adopted from his own garden and originally inspired by his studies in China.

2020: Lack of rain meant volunteers needed to water frequently, so we put 4" deep collars around the milkweeds to avoid having to flood the whole orchard. Dr. Wagner says it could take a few years for all the plants to bloom and set seed we can collect for his program.


Before


Finished Milkweed Orchard


Time- and Watersaving Collars

Native Heirloom Garden

2020: Despite the drought, this garden thrived due to the daily dedication of volunteers Robert Baer and Sara Day, under the continuing guidance of Eric Polinyouma. Unfortunately, a hard frost on September 10 clobbered most of the cultivars in the garden. Until that happened, the garden was again the showpiece of Willow Bend and attracted great admiration from visitors.

2021: Bob and Sara plan to travel often in the coming year. They will coach other volunteers on how to care for this garden in their absence.

Kitchen Garden

2020: Volunteers Robert Baer and Sara Day planted herbs and vegetables next to the back door of the EE Center and in the space across the path. The frost spared some of them—mostly herbs—which were harvested and shared with other volunteers in the fall.

2021: This space may be devoted to hardy perennial herbs next year, possibly as a soothing tea garden in keeping with the nearby Ethnobotanical Garden.

Ethnobotanical Garden (formerly the Michael Moore Medicinal Plant Garden)

2020: Volunteer Laura Davis relinquished her role as official curator of the Michael Moore Medicinal Plant Garden here to focus on a garden of the same name at the Museum of Northern Arizona. In 2020, volunteers repaired the stone borders and weeded. ACE made five pocket wetlands for selected species, using a brand of kitty litter made of pure bentonite clay. We added several more medicinal plants and shrubs. Supporter Kathleen Satterfield donated four native canyon grapes in large pots.

ACE fixing borders and making pocket wetlands.

Yerba Mansa

Ethnobotanical Garden in Late Summer.

Outdoor Classroom

2020: New this year, the Outdoor Classroom provides a space and features to encourage "Schema," which are activities for young children that develop their basic motor and cognitive skills. It included the pouring of an ADA accessible sidewalk, with animal tracks pressed into the concrete by Geoffrey Gross. Geoffrey also installed a timber-frame bench, two log benches, a shelving system for playthings, a metal fence, and several delightful bronzes of local creatures—all custom-made by Geoffrey—along with several boulders. Scout Austin Rae led his troop in covering the sloped edges of the space with wood chips, sanding and staining the two benches, and excavating, leveling, filling, and compacting an accessible play space with cinnamon soil. Children especially love discovering the animals!

2021: Over the winter, a sign will be installed to explain the Classroom's features and how to use them. The sign will also have space for a notice board listing the Environmental Education Center's programs. A curriculum for the Outdoor Classroom may be developed as well, depending partly on whether schoolchildren will be scheduled for visits to the gardens next year.



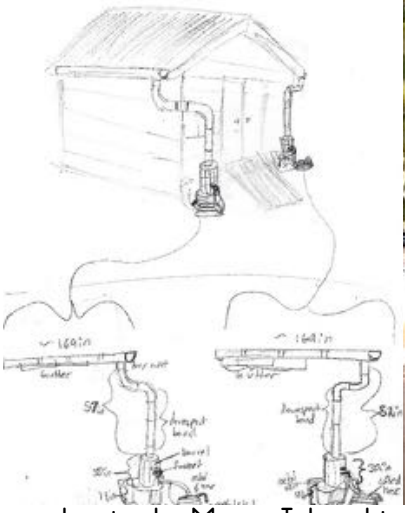



more photos on next page…



Water Collection from the Roof of the Garden Shed

2020: Under the supervision of volunteer Norm Lowe, Boy Scout Mason Takeuchi installed gutters and drainpipes on the shed roof to channel runoff into two water collection barrels donated by the USFS Rocky Mountain Research Station in 2019. These will be used to water the Forest Garden. A pipe under the sidewalk will carry overflow down into the Seasonal Wetland.


— drawing by Mason Takeuchi

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Forest Garden

2020: ACE removed the outdated interpretive sign and a flagstone, leaving a vacant space.

2021: Volunteers will plant understory species—propagated in the NAU Greenhouse and by The Arboretum at Flagstaff—in the vacant space and elsewhere in the Forest Garden.


Seasonal Wetland

2020: Two years of drought have hit the seasonal wetland especially hard. Wetland plants are barely surviving. Volunteers removed ragweed and other invasive plants to decrease competition. We added ten wetland perennials from The Arboretum in time for them to bloom and set seedmay begin to colonize the wetland next year.

2021: Some disturbance may occur when the pond is rebuilt. At that time, we will rescue plants that are in the path of the work and replant them when it is finished. It will probably be necessary to water them until they are established.